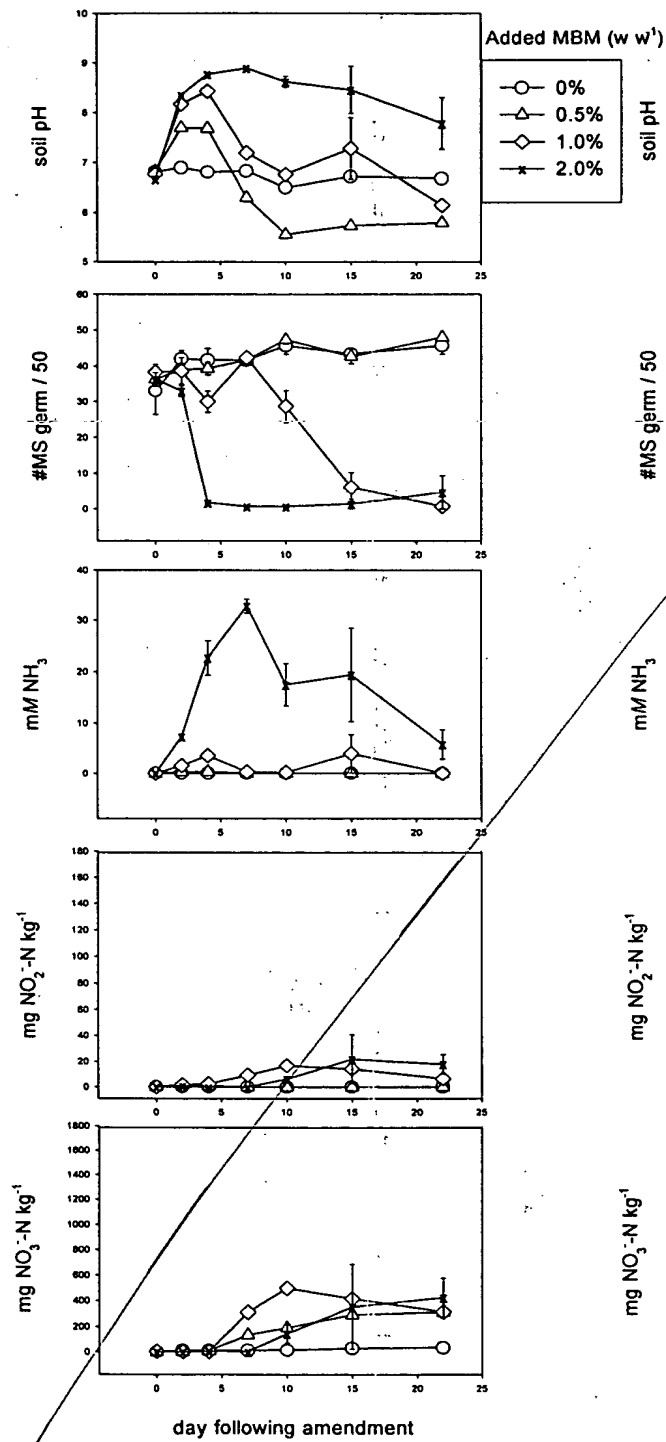


Beauseart Soil (loamy sand)



Thorndale Soil (loam)

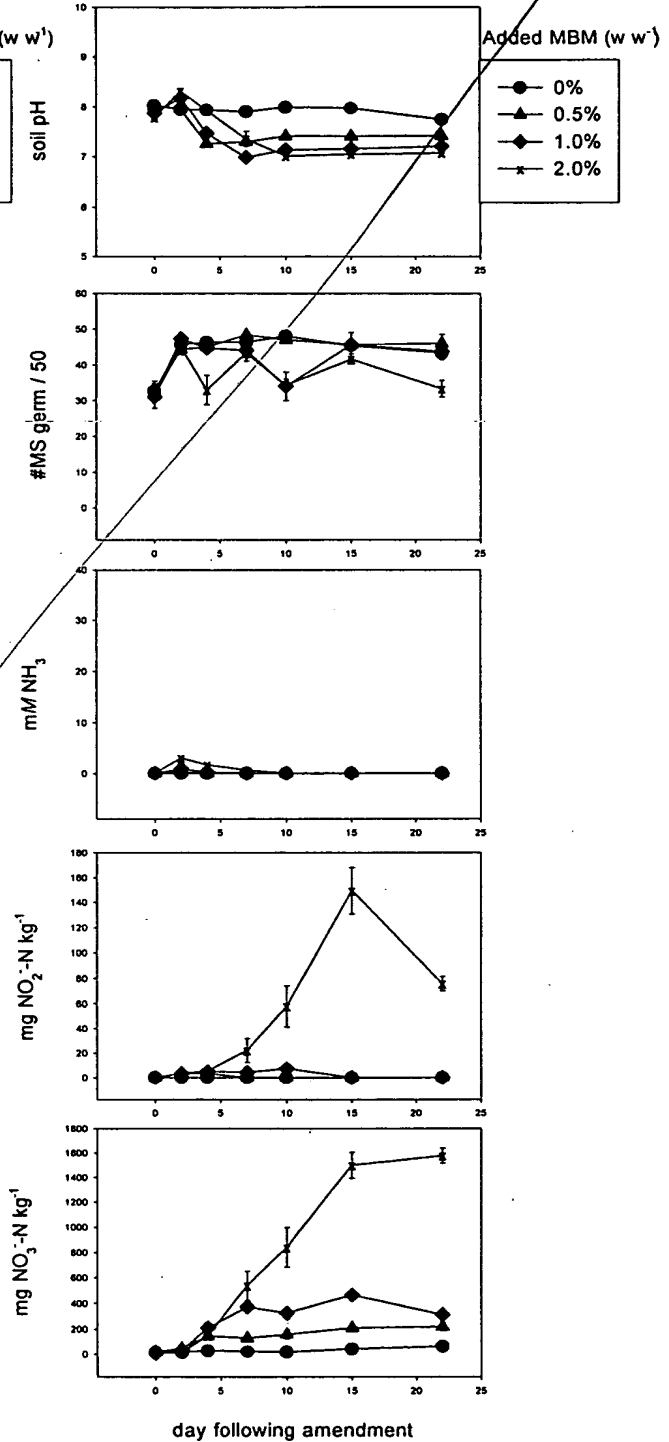


Fig. 1. Soil pH, # MS germinated out of 50 counted, NH<sub>3</sub> concentration in soil solution, NO<sub>2</sub><sup>-</sup> and NO<sub>3</sub><sup>-</sup> content in Beauseart and Thorndale soil amended with various rates of MBM (n=3; ±standard error).

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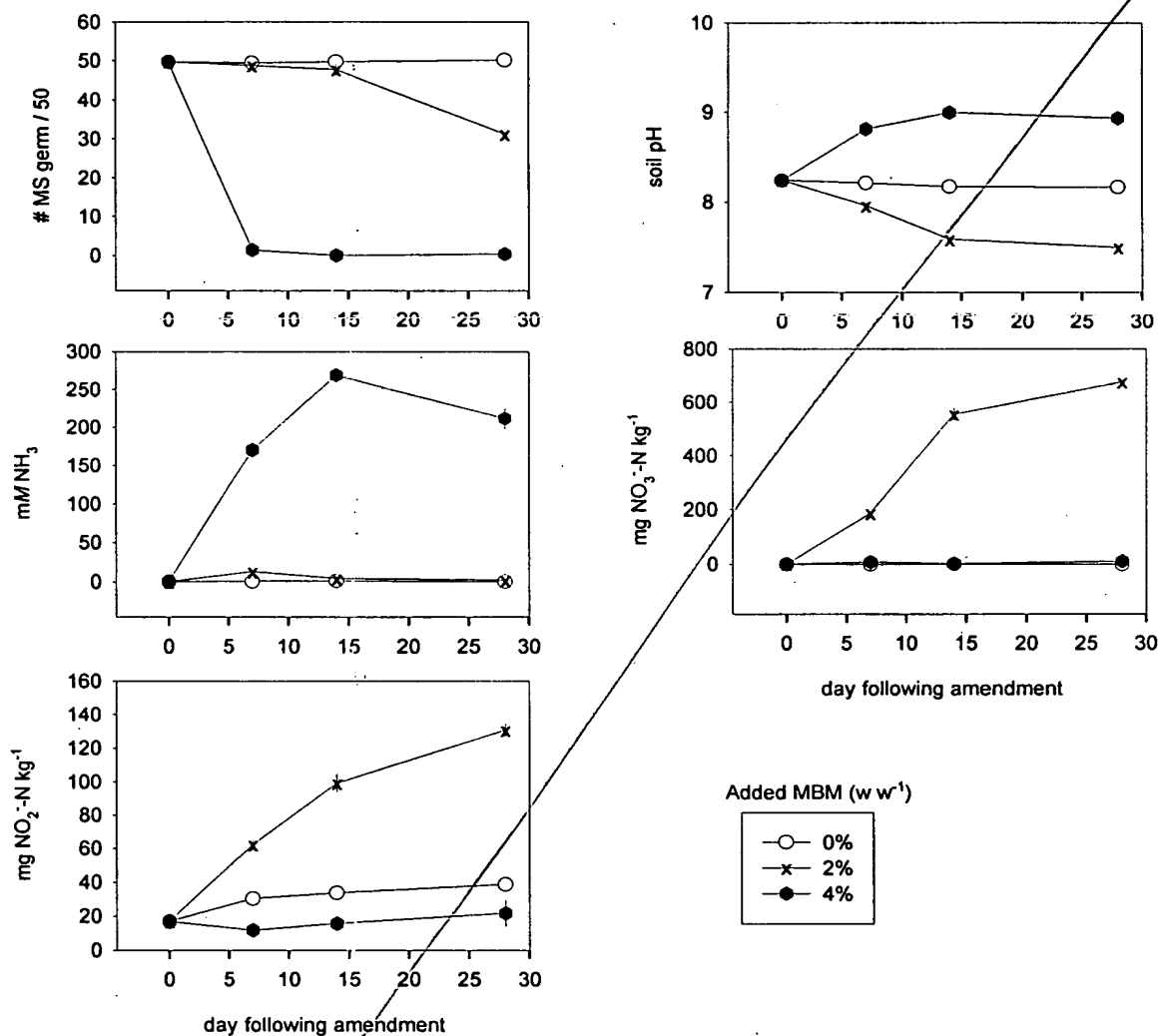


Fig. 2. Number MS germinated out of 50 counted, soil pH, NH<sub>3</sub> concentration in soil solution, NO<sub>3</sub><sup>-</sup> and NO<sub>2</sub><sup>-</sup> content of Thorndal soil amended with various rates of MBM (n=3; ±standard error).

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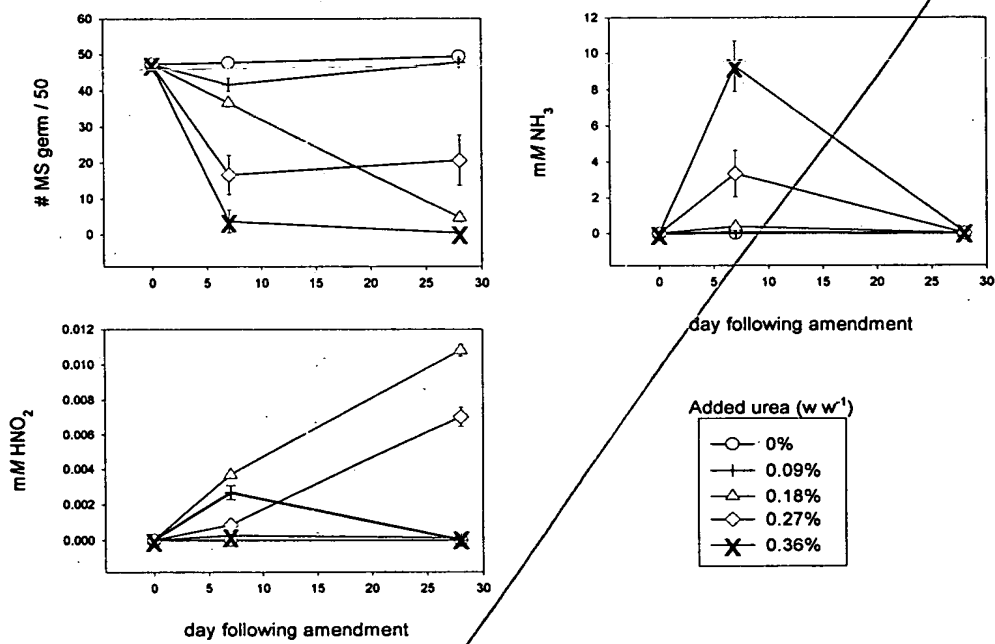


Fig. 3. Number MS germinated out of 50 counted, NH<sub>3</sub> and HNO<sub>2</sub> concentration in soil solution in Thorndale soil amended with various rates of urea (n=3;  $\pm$  standard error).

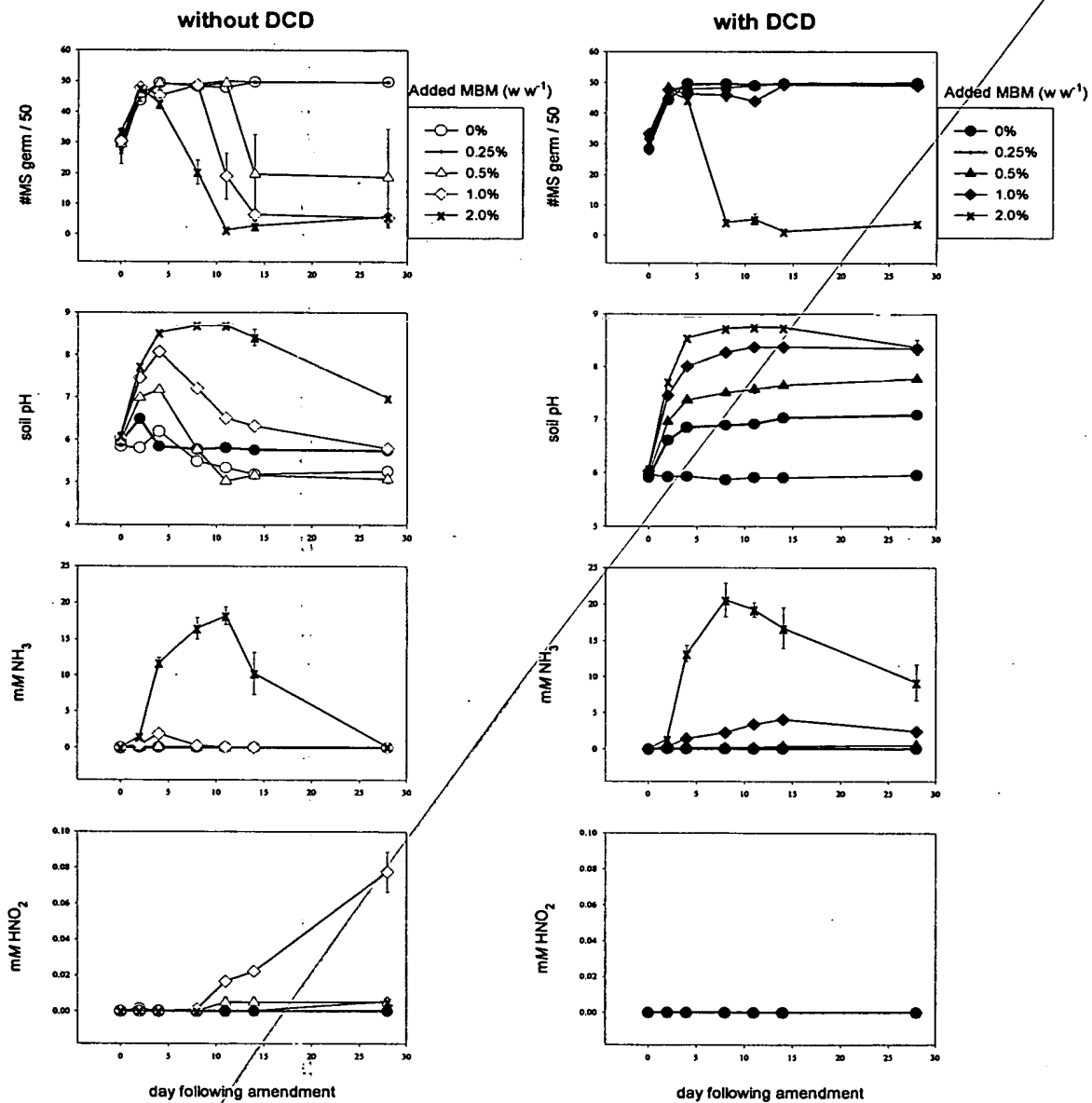


Fig. 4. Number MS germinated out of 50 counted, soil pH, NH<sub>3</sub> and HNO<sub>2</sub> concentration in soil solution in Beauseart soil (sandy loam) amended with various rates of MBM, with and without the nitrification inhibitor, dicyandiamide (DCD) added (n=3;  $\pm$  standard error).

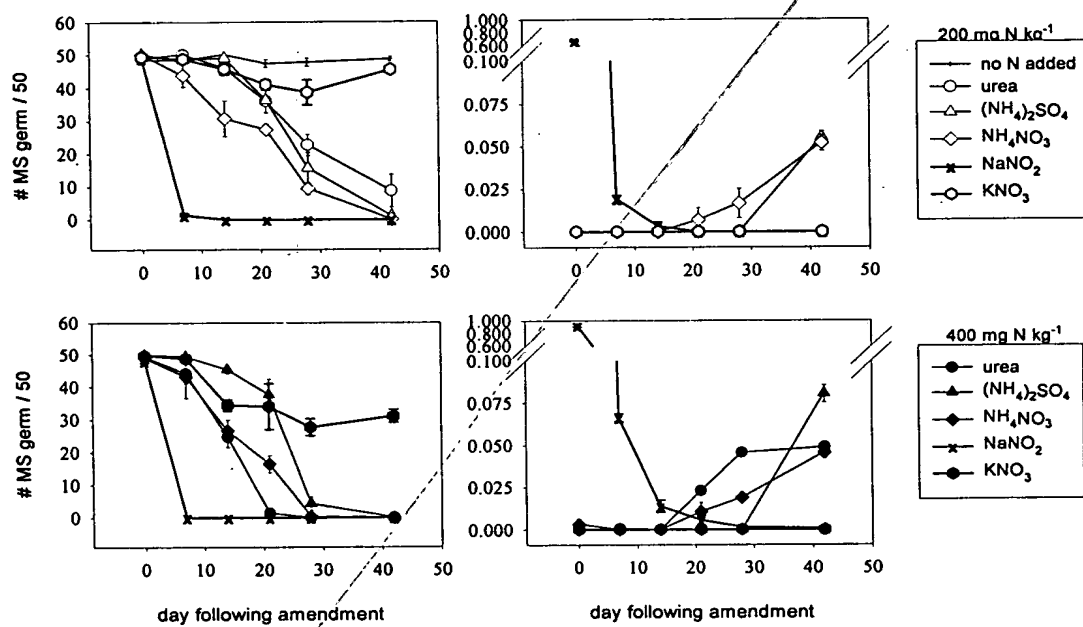


Fig. 5. Number of MS germinated out of 50 counted and HNO<sub>2</sub> concentration in soil solution of Beauseart soil amended with various fertilizer-N sources to 200 or 400 mg N kg<sup>-1</sup> (n=3; ±standard error).

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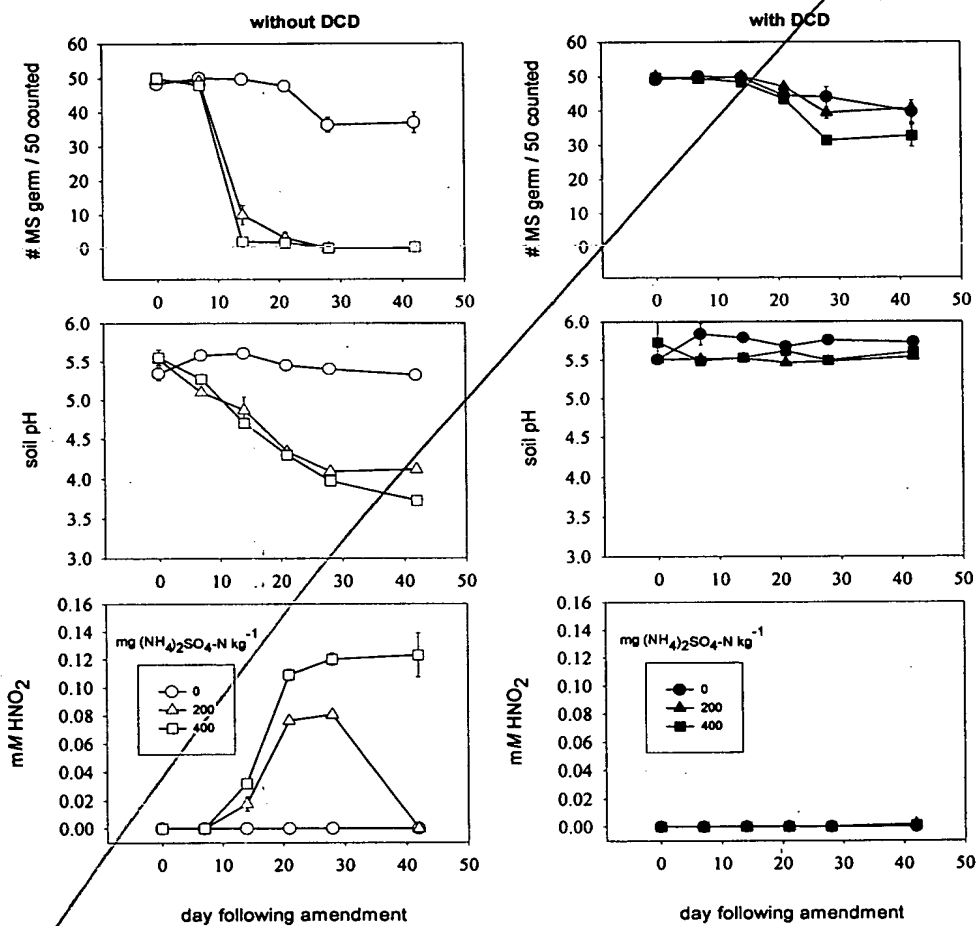


Fig. 6. Number of MS germinated out of 50 counted, soil pH and HNO<sub>2</sub> concentration in soil solution of Mackenzie soil amended with various amounts of (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>, with and without the nitrification inhibitor, dicyandiamide (DCD) added (n=3; ±standard error).

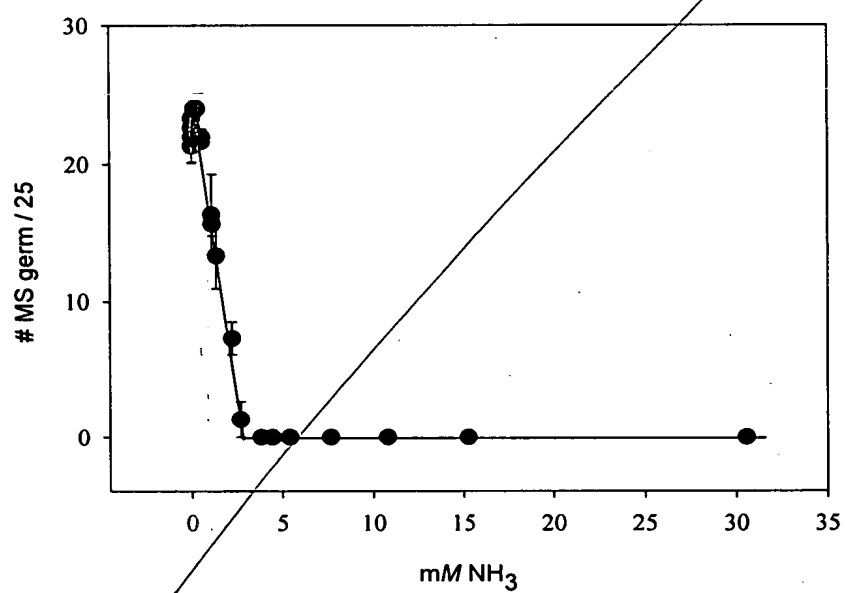


Fig. 7. Number of MS germinated out of 25 counted exposed for 2 weeks to various concentrations of  $\text{NH}_3$  in solid medium ( $n=3$ ;  $\pm$ standard error).

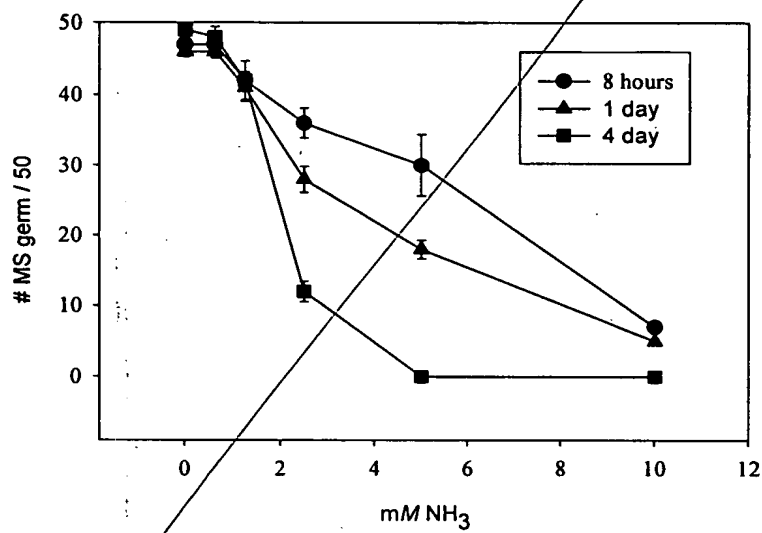


Fig. 8. Number of MS germinated out of 50 counted exposed for 8 h, 1 d and 4 d to various concentrations of  $\text{NH}_3$  in glycine buffer at pH 8.6 ( $n=3$ ;  $\pm$ standard error).



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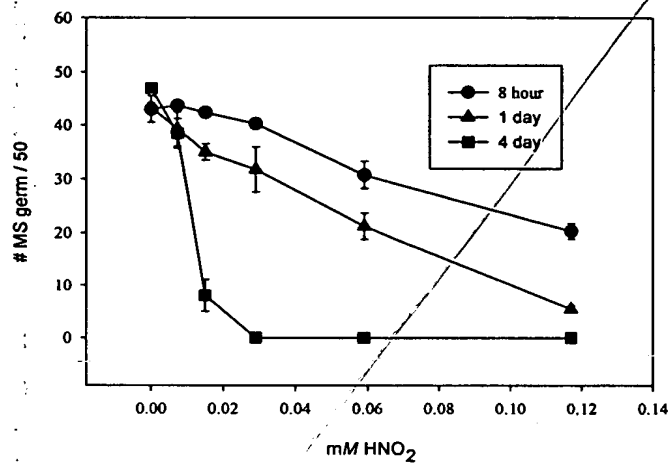


Fig. 9. Number of MS germinated out of 50 counted exposed for 8 h, 1 d and 4 d to various concentrations of  $\text{HNO}_2$  in citric acid buffer at pH 5.0 ( $n=3$ ;  $\pm$ standard error).

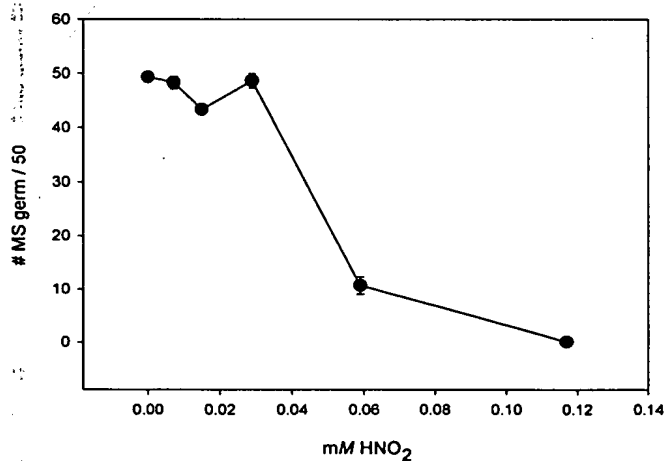


Fig. 10. Number of MS germinated out of 50 counted after suspension for 4 d to various concentrations of 30 mL  $\text{HNO}_2$  citric acid buffer at pH 5.0 in a 250 mL sealer jar ( $n=3$ ;  $\pm$ standard error).

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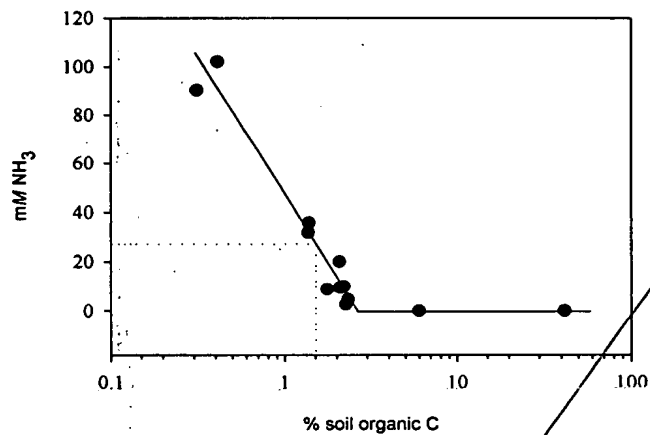


Fig. 11. Peak concentration of  $\text{NH}_3$  in soil solution measured for 12 soils amended with 2% MBM ( $\text{w w}^{-1}$ ) ( $n=3$ ;  $\pm$ standard error).

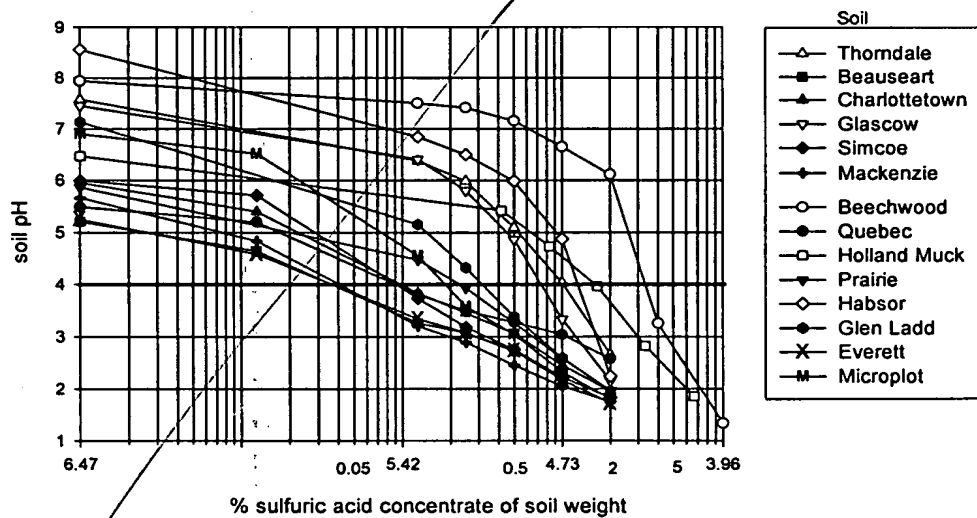


Fig. 12. Soil pH in response to addition of  $\text{H}_2\text{SO}_4$ . Soils in Group 1 are in filled symbols and Group 2 are in open symbols.

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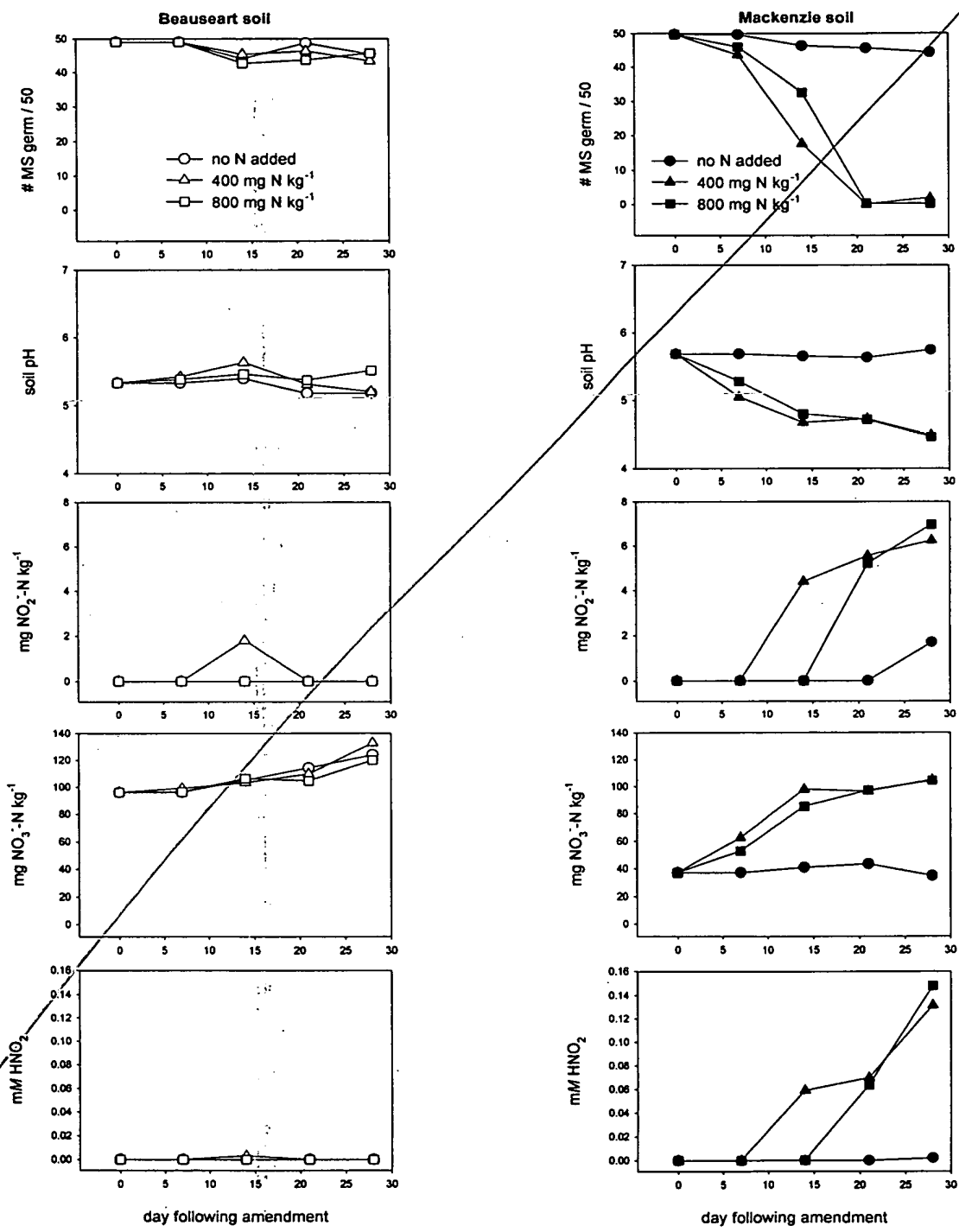


Fig. 13. Number of MS germinated out of 50 counted, soil pH, NO<sub>2</sub><sup>-</sup> and NO<sub>3</sub><sup>-</sup> content, and HNO<sub>2</sub> concentration in soil solution of Beauseart and Mackenzie soil amended with (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> to 200 or 400 mg N kg<sup>-1</sup> (n=3).

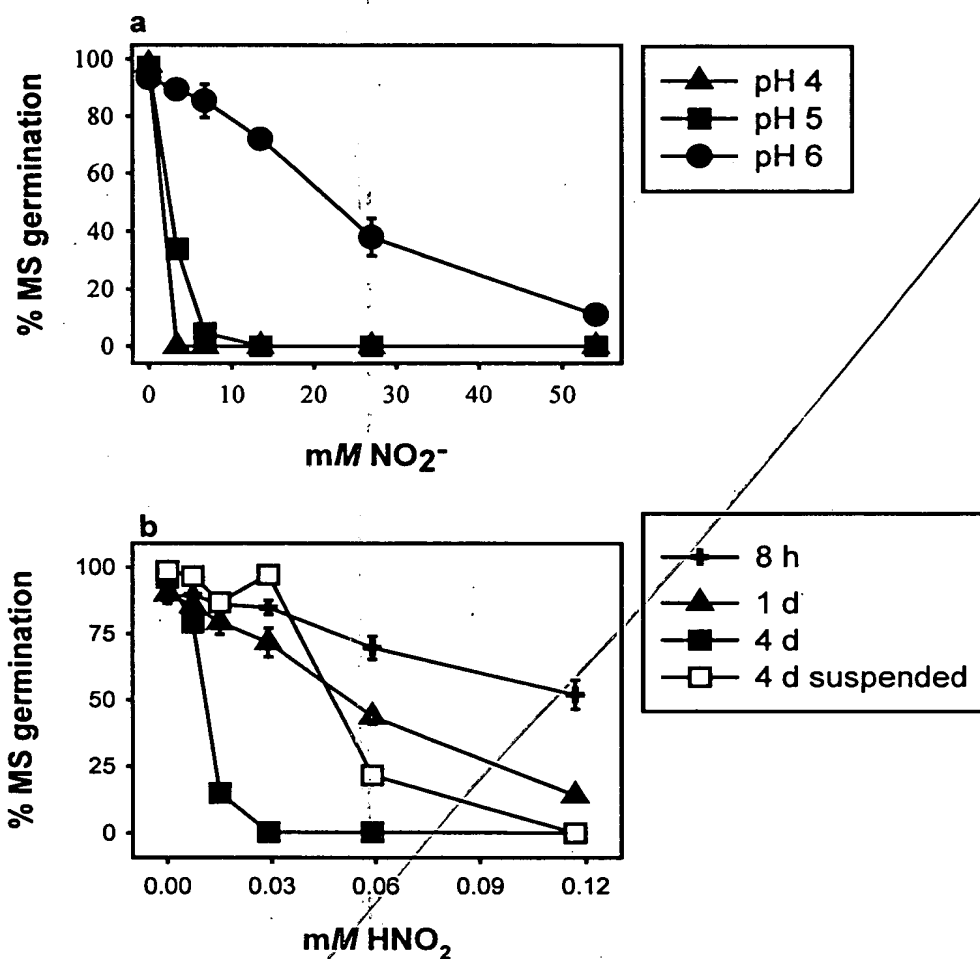


Fig. 14. Germination of *V. dahliae* MS after submergence in a 0.02 M citric acid buffered solution for a) 1 d exposure to various concentrations of  $\text{NO}_2^-$  at a solution pH of 4, 5 or 6 and b) 8 h, 1 and 4 d exposure in, or suspended above for 4 d a solution of pH 5 containing various levels of  $\text{HNO}_2$ . The concentration of  $\text{HNO}_2$  was estimated based on the concentration of  $\text{NaNO}_2$  and pH of the solution. Means ( $\pm 1$  se) of six replicates are shown.

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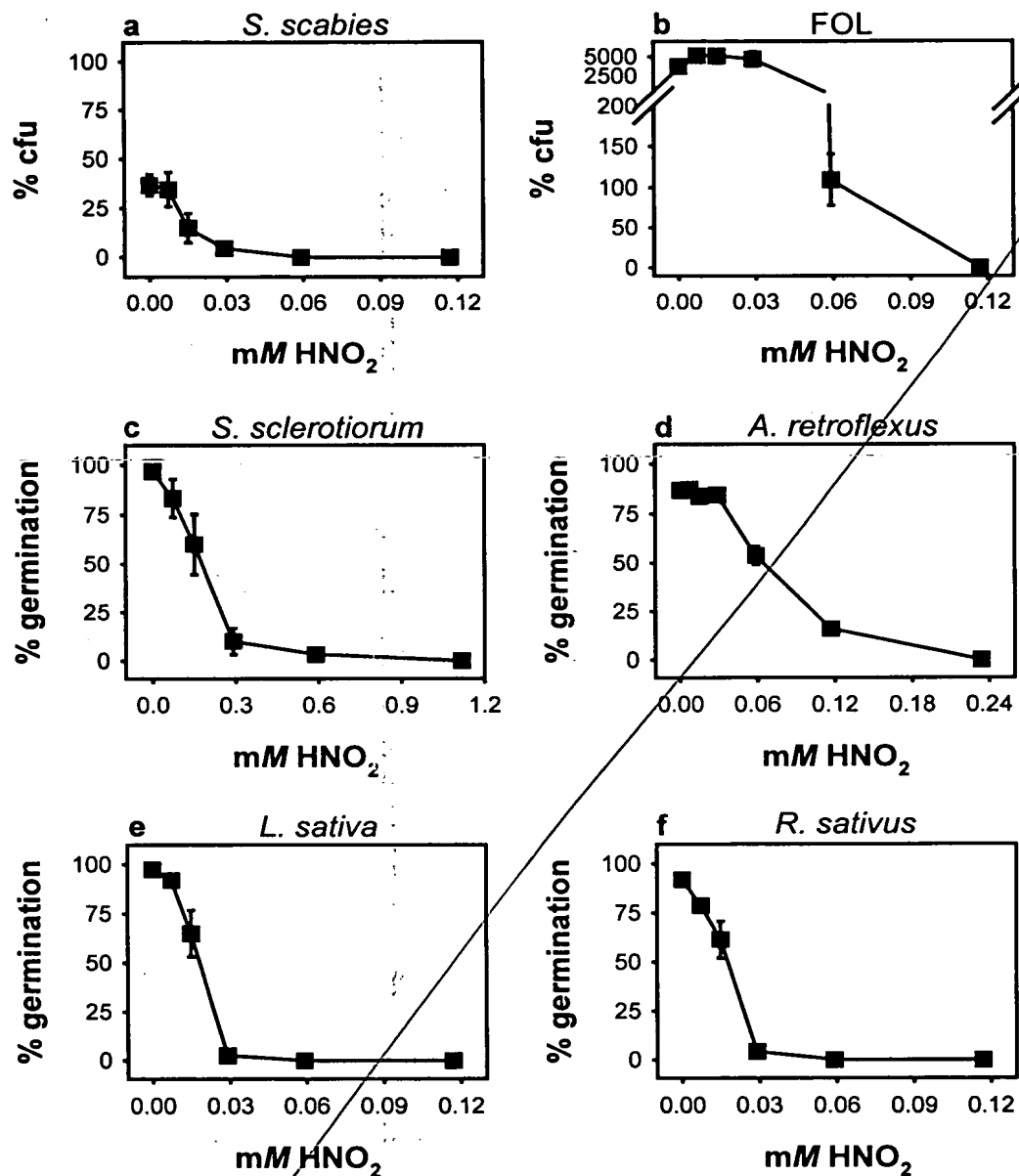


Fig. 15. Percent colony forming units (cfu) of a) spores of *Streptomyces scabies*, and b) chlamydospores of FOL, and germination of c) sclerotia of *Sclerotinia sclerotiorum*, and seeds of d) *A. retroflexus*, e) *L. sativa* and f) *Raphanus sativus* after submergence for 8 h, 1 and 4 d in 0.02 M citric acid buffered solutions (pH 5.0) containing various levels of  $\text{HNO}_2$ . The concentration of  $\text{HNO}_2$  was estimated based on the concentration of  $\text{NaNO}_2$  and pH of the solution. Means ( $\pm 1$  se) of six replicates are shown.